

WHAT IS CLAIMED IS:

1. A system for coating a substrate, the system comprising:
 - a vacuum chamber;
 - a rotatable tube positioned inside the vacuum chamber;
 - a shaft connected to the rotatable tube, the shaft partially outside the vacuum chamber;
 - a bearing positioned outside the vacuum chamber, the bearing configured to rotatably engage the shaft; and
 - a power coupler configured to deliver power to the rotatable tube, the power coupler positioned in front of the bearing to thereby limit the current that flows through the bearing.
2. The system of claim 1, wherein the power coupler is positioned inside the vacuum chamber.
3. The system of claim 1, wherein the rotatable tube and the shaft are integrated.
4. The system of claim 1, further comprising:
 - a seal configured to provide a seal between the vacuum chamber and the shaft;wherein the power coupler is positioned adjacent to the seal.
5. The system of claim 1, further comprising:

a drive system configured to rotate the shaft.

6. The system of claim 1, wherein the bearing comprises ceramic balls.
7. The system of claim 1, wherein the bearing comprises ceramic needles.
8. The system of claim 1, wherein the bearing comprises Mp35N.
9. The system of claim 1, wherein the power coupler is positioned outside the vacuum chamber.
10. The system of claim 1, wherein the power coupler comprises a water-cooled slip ring connector.
11. The system of claim 1, wherein the power coupler comprises a liquid-metal connector.
12. The system of claim 1, further comprising a support positioned inside the vacuum chamber, wherein the rotatable tube is continually supported by the support.

13. A system for coating a substrate, the system comprising:
 - a rotatable magnetron;
 - a bearing configured to rotatably engage the rotatable magnetron; and
 - a power coupler configured to deliver power to the rotatable magnetron, the power coupler positioned in front of the bearing to limit the current that flows through the bearing.
14. The system of claim 13, further comprising:
 - a vacuum chamber configured to house the rotatable magnetron;
 - a seal positioned between the bearing and the vacuum chamber;
 - wherein the power coupler is positioned between the bearing and the seal.
15. The system of claim 13, wherein the power coupler is positioned inside the vacuum chamber.

16. A system for coating a substrate, the system comprising:
- a vacuum chamber;
 - a rotatable tube positioned inside the vacuum chamber;
 - a shaft connected to the rotatable tube, the shaft partially outside the vacuum chamber;
 - a bearing positioned outside the vacuum chamber, the bearing configured to rotatably engage the shaft; and
 - a liquid-metal electrical connector engaged with the shaft, the liquid-metal electrical connector configured to deliver power to the rotatable tube.
17. The system of claim 16, wherein the bearing is a non-metallic bearing.
18. The system of claim 16, wherein the liquid-metal electrical connector is positioned between the bearing and the rotatable tube.

19. A system for coating a substrate, the system comprising:
a rotatable target;
a bearing configured to rotatably engage the rotatable target; and
a liquid-metal electrical connector configured to deliver power to the rotatable target.

20. The system of claim 19, wherein the liquid-metal electrical connector is positioned between the bearing and the rotatable target to limit the current that flows through the bearing.